21st, inclusive, the meteorological conditions continued normal, following the passage of depression number 7, and no fog was reported. During the 22d and 23d fog was occasioned by the passage of a cyclonic area over the Gulf of Saint Lawrence and northern Newfoundland, and from the 24th to the 29th, inclusive, fog attended the approach and passage of depression number 9.

In the vicinity of Sable Island Bank fog prevailed on the 1st, 2d, and 15th. On the 1st and 2d marked ranges in temperature, attending the intermingling of warm southerly and cold northerly winds, occasioned rain and fog in that locality, and on the 15th the presence of cyclonic areas, one over the Gulf of Saint Lawrence and the other over the ocean to the southward, contributed to cause abnormal meteorological conditions. Fog was reported off the coast of the United States between the thirty-eighth and forty-third parallels on the 14th and 15th, and was apparently occasioned by the intermingling of warm southeast winds preceding, and cold northerly winds following, the passage of a cyclonic area over the Gulf of Saint Lawrence.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for September, 1887, is exhibited on chart ii by the dotted isothermal lines. In the tables of miscellaneous data are given the monthly mean temperatures, with the departures from the normal, for the various stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature, precipitation, and departures from the normal, show respectively the averages for the several districts. The normal for any district may be found by adding the departure to the current mean for the district when the departure is below the normal, and subtracting when above. On chart iii the departures from the normal are illustrated by lines connecting stations of normal or equal abnormal values.

On the Pacific coast, in the Canadian Maritime Provinces, and along the central and western portions of the Gulf coast the mean temperature of September, 1887, is normal, or nearly so, the departures at a majority of stations not exceeding half of a degree. In the Rocky Mountain districts the month was decidedly warmer than the average, the departures from the normal temperature generally exceeding 2° over the southern districts, while over the northern they amount to, or exceed, 4°.

The most important feature of this month's temperature is the low monthly means in portions of the lower lake region, New England, and the middle Atlantic states, where the mouth averages from 4° to 6° colder than the normal, and it is worthy of note that this region coincides with that over which occurred the remarkably high mean temperatures of July, 1887.

The following are some of the most marked departures from the normal temperature at Signal Service stations, where the records cover eight or more years of observation:

Above normal.	°	Below normal.	°
Red Bluff, Cal	5.4	Mount Washington, N. H	5.9
Boisè City, Idaho	4.2	Albany, N. Y.	5.7
Fort Buford, Dak.	4.2	Saugeen, Ontario	5.7
Fort Apache, Ariz.	3.8	Baltimore, Md	5.3
Santa Fé, N. Mex.	2.8	Philadelphia, Pa	5.0
Salt Lake City, Utah	2.7	Detroit, Mich	5.0
Deadwood, Dak.	2.7	Lynchburg, Va.	4.3
Cheyenne, Wyo.	2.6	Rochester, N. Y.	4.3

RANGES OF TEMPERATURE.

The greatest daily range of temperature was 52° at Saint Vincent, Minn., on the 29th; the maximum daily ranges exceed 40° over the region extending from the extreme northwest southwestward to central California and in the districts to the northward; along the Gulf coast they vary from 15° to 20°.

The least daily ranges along the coasts of the Atlantic, Gulf, and Pacific are less than 5°, while over the interior of the country east of the Rocky Mountains, except at stations on the Great Lakes, they increase to 10°, and to 20° at stations in the central Rocky Mountain region.

The monthly, and the greatest and least daily, ranges of temperature, at Signal Service stations are given in the tables of miscellaneous meteorological data.

The monthly ranges exceed 60° at Lynchburg, Va., at some stations in the extreme northwest, and over portions of the middle plateau and middle Pacific coast region; along the Atlantic, Gulf, and Pacific coasts the monthly ranges are generally less than 40°, and at many stations are below 30°.

The following are some of the greatest and least monthly ranges at Signal Service stations:

Greatest.	°	Least.	°
Fort Klamath, Oregon	67.0	Key West, Fla.	16.3
Saint Vincent, Minn.	66.9	San Diego, Cal	21.4
Huron, Dak.	63.4	Fort Grant, Ariz	25.5
Poplar River, Mont.	62.2	Tatoosh Island, Wash	27.0
Las Animas, Colo.	61.2	Brownsville, Tex	27.2
Moorhead, Minn.	61.0	Titusville, Fla.	27.7
Winnemucca, Nev	60.4	Fort Bowie, Ariz	27.8
Boisé City, Idaho	60.2	Cedar Keys, Fla	28.4
Lynchburg, Va.	60.1	Corpus Christi, Tex	29.2

DEVIATIONS FROM NORMAL TEMPERATURES.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperatures for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for September, 1887; (4) the departures of the current month from the normal; (5) and the extreme monthly means for September during the period of observations and the year of occurrence:

State and station.	County.	(1) Normal for the month of Sept.	(2) Length of record.	(3) Total for Sept., 1887.	(4) Departure from normal.	(5) Extreme monthly mean temperature for September.			
						Highest.		Lowest.	
						Am't.	Year.	Am't.	Year.
Arkansas.		°	*Years.*	°	°	°		°	
Lead Hill	Boone	72.2	6	72.8	+0.6	76.4	1884	67.5	1883
California.									
Sacramento	Sacramento	66.7	21	65.2	−1.5				
Connecticut.									
Middletown	Middlesex	61.3	29	57.8	−3.5				
New Haven	New Haven	62.7	101	59.7	−3.0				
Thompson	Windham	61.4	30	56.2	−5.2				
Waterbury	New Haven	63.1	12	57.0	−6.1				
Dakota.									
Webster	Day	63.1	5	57.9	−5.2				
Illinois.									
Aurora	Kane	64.3	9	63.5	−0.8				
Golconda	Pope	71.1	10	72.3	+1.2				
Greenville	Bond	68.9	9	68.0	−0.9				
Mattoon	Coles	67.6	7	67.3	−0.3	71.0	1880–'84	64.0	1880
Peoria	Peoria	66.8	32	68.6	+1.8				
Riley	McHenry	60.4	26	59.3	−1.1				
Sycamore	De Kalb	62.5	7	60.8	−1.7				
Indiana.									
Connersville	Fayette	65.1	6	65.4	+0.3				
Lafayette	Tippecanoe	64.8	8	64.8	0.0				
Logansport	Cass	65.8	33	66.7	+0.9	73.8	1881	61.1	1868
Sunman	Ripley	66.8	5	66.6	−0.2				
Vevay	Switzerland	68.7	21	68.5	−0.2				
Worthington	Greene	67.2	6	68.7	+1.5				
Iowa.									
Cresco	Howard	59.4	10	58.0	−1.4				
Monticello	Jones	61.5	34	61.0	−0.5	73.0	1865	51.0	1856
Kansas.									
Independence	Montgomery	69.8	15	69.8	0.0				
Lawrence	Douglas	66.4	20	67.6	+1.2				
Wellington	Sunman	69.4	9	73.2	+3.8	74.5	1884	63.8	1883
Yates Centre	Woodson	68.1	7	64.4	−3.7				
Maine.									
Belfast	Waldo	57.6	28	55.5	−2.1				
Cornish	York	59.8	30	55.2	−4.6				
Gardiner	Kennebec	58.4	51	55.0	−3.4				
Orono	Penobscot	57.3	19	54.5	−2.8				
Maryland.									
Cumberland	Alleghany	64.2	16	62.0	−2.2				
Fallston	Harford	65.8	17	61.6	−4.2	74.6	1881	61.3	1871

Deviations from normal temperatures—Continued.

State and station.	County.	(1) Normal for the month of Sept.	(2) Length of record.	(3) Total for Sept., 1887.	(4) Departure from normal.	(5) Extreme monthly mean temperature for September.			
						Highest.		Lowest.	
						Am't.	Year.	Am't.	Year.
Massachusetts.		°	*Years.*	°	°	°		°	
Amherst	Humpshire	60.2	50	57.8	−2.4				
Cambridge	Middlesex	61.8	65	59.8	−2.0				
Fitchburg	Worcester	59.7	31	56.2	−3.5				
New Bedford	Bristol	59.2	75	58.4	−0.8				
Somerset	Bristol	64.3	17	62.1	−2.2				
Springfield	Hampden	62.9	20	59.5	−3.4				
Taunton	Bristol	64.0	16	58.5	−5.5				
Nevada.									
Carson City	Ormsby	59.8	9	59.0	−0.8				
New Brunswick.									
Saint Johns	Saint Johns	55.2	27	53.3	−1.9				
New Hampshire.									
Concord	Merrimac	61.0	20	56.0	−5.0				
Hanover	Grafton	57.4	28	54.0	−3.4				
New Jersey.									
Dover	Morris	64.4	5	58.3	−6.1				
South Orange	Essex	63.6	18	61.2	−2.4				
New York.									
Factoryville	Tioga	59.4	6	55.9	−3.5				
Humphrey	Cattaraugus	60.9	3	57.9	−3.0				
Palermo	Oswego	60.4	34	54.6	−5.8	67.8	1881	54.1	1867
Ohio.									
North Lewisburg	Champaign	62.2	55	65.9	+3.7				
Wauseon	Fulton	62.4	17	61.2	−1.2	71.1	1881	57.2	1883
Pennsylvania.									
Corry	Erie	62.8	7	57.1	−5.7	71.8	1881	57.1	1887
Dyberry	Wayne	59.0	21	54.7	−4.3				
South Carolina.									
Stateburg	Sumter	73.4	7	71.3	−2.1				
Texas.									
New Ulm	Austin	77.7	16	78.3	+0.6	81.1	1879	75.6	1876
Vermont.									
Strafford	Orange	58.6	13	56.5	−2.1	64.3	1881	56.2	1876
Virginia.									
Bird's Nest	Northampton	70.6	19	69.1	−1.5				
Dale Enterprise	Rockingham	72.8	7	68.3	−4.5				
Variety Mills	Nelson	67.0	10	63.3	−3.7	75.2	1881	62.8	1879
Wytheville	Wythe	63.5	22	63.1	−0.4				
West Virginia.									
Helvetia	Randolph	61.5	10	60.3	−1.2				

FROST.

Frost occurred in the several states and territories during the month, as follows:

1st.—Mass., Mont., Nebr., Oregon, Pa.

2d.—Nev., Oregon.

3d.—Colo., Oregon.

4th.—Colo., Ohio.

5th.—Nev., Oregon.

6th.—Mich.

7th.—Dak., Mich., Minn.

8th.—Ill., Iowa, Mich., Minn., Nev., N. H., Ohio, Wis.

9th.—Mich., Minn., Oregon, Pa., Vt., Va.

10th.—Dak., Mich., Minn., Nev., N. H., Pa., Wis.

11th.—Me., N. Y., Vt.

12th.—Cal., Colo., Mich., Nev., Ohio, Oregon.

13th.—Colo., Dak., Nebr., Nev., Oregon.

14th.—Dak., Ill., Minn., Nebr., Nev., Oregon.

15th.—Dak., Me., Mich., Minn., Mont., Nebr., Nev., Oregon.

16th.—Colo., Ill., Ind., Iowa, Mich., Nebr., N. Y., Ohio, Oregon, Pa., Wis.

17th.—Conn., Ill., Iowa, Me., Mass., Mich., Nev., N. H., N. J., N. Y., Ohio, Oregon, Pa., Vt., Wash., Wis.

18th.—Conn., Iowa, Me., Mass., Minn., Nev., N. H., N. J., N. Y., Oregon, Pa., Vt.

19th.—Iowa, Me., Mich., Nev., N. H., Oregon, Wis.

20th.—Mont., Nev., N. C., Ohio, Oregon, Wash.

21st.—Dak., Mass., Minn., Mont., Nev., N. H., Oregon, Pa.

22d.—Dak., Minn., Mont., Oregon, Wash.

23d.—Dak., Ill., Iowa, Mich., Minn., Mo., Mont., Nebr., Oregon, Pa., W. Va., Wis.

24th.—Ark., Colo., Conn., Dak., Ill., Ind., Iowa, Ky., Me., Mass., Mich., Mo., N. H., N. Y., N. C., Ohio, Oregon, Pa., Tenn., Vt., Va., W. Va., Wis.

25th.—Colo., Conn., Dak., Ind., Md., Mass., Mich., Minn., N. J., N. Y., N. C., Ohio, Oregon, Pa., S. C., Tenn., Vt., Va., W. Va.

Table of comparative maximum and minimum temperatures for September.

State or Territory.	Station.	For 1887.		Since establishment of station.				Length of record.
		Max.	Min.	Max.	Year.	Min.	Year.	
		°	°	°		°		*Years*
Alabama	Mobile	96.2	53.2	96.0	1881	53.0	1871	17
Do	Montgomery	98.8	50.0	97.0	1875, 1884	51.5	1876	15
Arizona	Yuma	105.4	62.5	113.0	1879	50.0	1882	12
Do	Fort Grant	88.9	56.7	98.0	1879	47.0	1881	9
Arkansas	Fort Smith	96.9	45.0	99.9	1884	39.6	1883	5
Do	Little Rock	97.0	50.1	97.0	1881	47.0	1881	9
California	Los Angeles	91.0	49.2	108.5	1885	44.0	1880	11
Do	San Francisco	89.0	49.9	93.9	1886	50.0	1874, 1880, 1881, 1882	17
Colorado	Denver	87.6	35.0	93.0	1878	28.0	1873	16
Do	Pike's Peak	51.3	15.4	55.0	1875	6.0	1876	14
Connecticut	New Haven	77.7	35.8	100.0	1881	35.0	1879	15
Dakota	Bismarck	85.3	28.0	95.0	1885	10.0	1876	14
Do	Deadwood	80.0	33.3	91.0	1881	28.0	1884	9
Dist. of Columbia	Washington City	89.6	42.0	104.3	1881	38.0	1879	17
Florida	Cedar Keys	90.6	62.2	94.0	1881	64.0	1880	8
Do	Pensacola	93.6	58.8	93.5	1884	57.3	1882	8
Georgia	Augusta	98.2	44.9	97.0	1875	48.0	1876	15
Idaho	Boisé City	93.4	33.2	96.0	1878	27.9	1886	11
Illinois	Cairo	94.6	44.0	97.0	1881	42.0	1876	16
Do	Chicago	90.0	41.0	93.9	1881	37.0	1872	16
Indiana	Indianapolis	93.1	34.0	94.5	1881	35.0	1875	15
Indian Ter.	Fort Sill	96.0	48.2	100.0	1881	47.0	1880	11
Iowa	Dubuque	87.6	37.7	94.2	1881	33.0	1873	15
Do	Des Moines	92.3	34.1	93.2	1886	34.0	1879	10
Kansas	Dodge City	96.5	38.3	99.3	1881	30.0	1876	14
Do	Leavenworth	94.7	43.0	101.0	1882	37.0	1876	17
Kentucky	Louisville	94.5	42.3	99.0	1881	42.0	1875, 1876	16
Louisiana	New Orleans	96.0	60.1	92.3	1884	58.0	1871	17
Do	Shreveport	100.0	53.8	100.1	1881	47.0	1881	15
Maine	Eastport	72.0	37.0	82.8	1884	35.0	1875	15
Do	Portland	74.9	36.5	94.5	1881	37.0	1875	16
Maryland	Baltimore	87.9	42.2	101.0	1881	40.0	1873, 1879	16
Massachusetts	Boston	80.3	40.3	101.5	1881	34.0	1879	17
Michigan	Marquette	82.0	32.8	97.0	1874	28.0	1883	14
Do	Grand Haven	82.1	31.9	85.0	1878	30.0	1879	15
Minnesota	Saint Vincent	85.4	18.5	89.0	1883	17.0	1883	8
Do	Saint Paul	83.2	33.5	94.0	1878	30.0	1873	15
Mississippi	Vicksburg	96.3	52.2	98.0	1881	48.0	1871	16
Missouri	Saint Louis	97.4	44.8	101.5	1881	40.0	1875	17
Montana	Fort Assinaboine	83.6	33.1	92.7	1885	25.0	1884	8
Do	Helena	81.1	31.8	88.1	1885	30.0	1880, 1882	8
Nebraska	North Platte	94.0	30.3	101.0	1881	21.0	1876	14
Do	Omaha	92.1	38.9	98.8	1881	30.0	1873	15
Nevada	Winnemucca	88.4	28.0	94.0	1878, 1880	22.0	1880 1881,	9
New Hampshire	Mt. Washington	56.0	17.5	65.0	1880	11.0	1879	16
New Jersey	Atlantic City	78.4	40.5	94.0	1880	43.0	1875	14
New Mexico	Santa Fé	80.0	38.0	90.0	1879	27.0	1880	14
New York	Buffalo	79.2	36.5	88.1	1884	35.0	1878	15
Do	New York City	84.4	41.3	100.2	1881	36.0	1872	16
North Carolina	Charlotte	93.9	39.5	94.0	1881	43.0	1879	9
Do	Wilmington	91.0	42.3	96.0	1872	47.0	1879	17
Ohio	Cincinnati	93.0	40.2	95.0	1881	40.9	1885	17
Do	Sandusky	95.0	42.0	95.8	1881	38.0	1880	11
Oregon	Portland	86.6	40.3	93.0	1886	39.0	'73, '77, '82	15
Do	Roseburg	95.1	36.3	95.5	1886	34.6	1881	10
Pennsylvania	Pittsburg	91.5	36.3	101.6	1881	35.0	1879	15
Do	Philadelphia	85.7	42.4	101.5	1881	43.0	1879	17
Rhode Island	Block Island	74.0	47.0	86.5	1881	41.5	1883	8
South Carolina	Charleston	90.1	49.2	94.0	1876	54.0	1879	15
Tennessee	Knoxville	94.0	37.8	97.1	1881	40.0	1871	17
Do	Memphis	98.7	49.2	98.0	1881	44.0	1875	15
Texas	Brownsville	90.1	62.9	56.0	'77, '78, '79, '83, '84	57.0	1883	11
Do	Fort Elliott	95.4	38.7	98.0	1881	37.0	1880	6
Utah	Salt Lake City	89.9	39.5	93.0	1875	36.0	1881	14
Virginia	Lynchburg	96.9	36.8	98.3	1881	40.0	1875, 1879	15
Do	Norfolk	91.4	46.0	96.0	1880	50.5	1875	17
Washington Ter.	Spokane Falls	84.1	31.7	87.0	1882	31.0	1881	7
Do	Olympia	82.8	34.2	82.6	1886	31.0	1877	11
Wisconsin	La Crosse	85.0	33.5	92.0	1873	31.0	1873	15
Do	Milwaukee	85.9	37.8	94.0	1872, 1874	32.0	1876	17
Wyoming	Cheyenne	86.0	32.7	88.0	1875	23.0	1878	14

26th.—Colo., Conn., Dak., D. C., Ind., Md., Mass., Mich., N. H., N. J., N. Y., N. C., Ohio, Oregon, Pa., Vt., Va., W. Va.

27th.—Conn., Dak., Mass., Mont., Nebr., N. H., N. Y., Pa., R. I., Vt.

28th.—Colo., Dak., Mich., Minn., Nebr., N. Mex.

29th.—Colo., Dak., Mich., Minn., Nebr., N. H., N. Mex.

30th.—Dak., Nebr.

The following reports of injury to vegetation by frost have been received:

Fort Bidwell, Modoc Co., Cal.: the heavy frost which occurred on the 1st was the first of the season; vegetables and flowers were seriously damaged.

Linkville, Klamath Co., Oregon: the heavy frost which occurred on the 1st injured crops to a great extent. Another damaging frost occurred on the 12th.

Moorhead, Minn.: the first killing frost of the season occurred on the morning of the 10th; tender vegetation froze.

Fort Totten, Dak.: the heavy frost of the 12th caused some damage to late vegetation; on account of the season being so far advanced the damage was not serious.

Oswego, N. Y.: heavy frost was observed on the morning of the 12th in

portions of Lewis county (adjoining Oswego county to the eastward), and more or less injury was done to crops, especially in the uplands.

Fort Buford, Dak.: the first frost of the season occurred on the 18th, and caused some injury to vegetation.

Albany, N. Y.: the first frost of the season occurred on the 17th, causing slight damage to late vegetation.

Vienna, Johnson Co., Ill.: a heavy frost occurred during the night of the 23d–24th, causing considerable damage.

Owensborough, Daviess Co., Ky.: a heavy frost occurred throughout this county during the night of the 23d–24th. Tobacco in the lowlands, which, owing to the drought, constitutes about three-fourths of the entire crop, was seriously injured, and vegetables were killed.

Grand Haven, Mich.: heavy frost occurred on the morning of the 24th, doing considerable damage to tender vegetation throughout this part of Michigan.

Jackson, Cape Girardeau Co., Mo.: the first frost of the season occurred on the morning of the 24th; vegetation was only slightly injured.

Sycamore, DeKalb Co., Ill.: the heavy frost on the 24th did much damage in this county.

Champaign, Champaign Co., Ill.: heavy frost occurred on the morning of the 24th, killing tender vegetation. Reports from Duquoin, Perry Co., Tolono, Champaign Co., Marshall, Clarke Co., and Taylorville, Christian Co., state that frosts occurred on the above date in those localities, but no serious injury resulted.

College Hill, Hamilton Co., Ohio: the first frost of the season occurred on the 24th; tomato, pumpkin, and cucumber vines were seriously injured.

Columbus, Ohio, the light frost of the 24th caused slight damage to crops in this vicinity; reports from the northwestern counties indicate that frost seriously injured tobacco.

Bristol, Sullivan Co., Tenn.: a heavy frost occurred during the night of the 24–25th. Farmers report that the tobacco crop was seriously injured.

Henderson, Henderson Co., Ky.: the damage done to the tobacco crop by the frost of the 25th is estimated at about 10 per cent. of the entire crop.

Hopkinsville, Christian Co., Ky.: the frost on the morning of the 25th damaged tobacco considerably on low ground, but on high land the damage was slight.

Wytheville, Wythe Co., Va.: heavy frosts occurred on the mornings of the 25th and 26th; no serious damage resulted.

Blue Ridge, Botetourt Co., Va.: light frosts occurred on the 24th, 25th, and 26th; no appreciable damage was done to tobacco.

Lynchburg, Va.: heavy frost was reported in the surrounding country on the morning of the 25th, doing considerable damage to crops, particularly tobacco.

Variety Mills, Nelson Co., Va.: the first frost of the season occurred on the 25th; sweet potato vines, corn, beans, and tobacco sustained serious injury; this is the earliest damaging frost that has occurred at this place during the last thirteen years.

Asheville, Buncombe Co., N. C.: a heavy frost occurred during the night of the 24–25th; about one-fourth of the outstanding tobacco was damaged.

Henderson, Vance Co., N. C.: tobacco on lowlands was slightly damaged by frost on the 25th.

Statesville, Iredell Co., N. C.: the heavy frost on the 25th did considerable damage to tobacco.

Raleigh, N. C.: the first frost of the season occurred on the 25th, and although no damage occurred in this vicinity, reports from the western part of the state indicate that the tobacco crop sustained serious injury.

Columbia, S. C.: light frost is reported to have occurred during the night of the 24–25th, injuring tender plants.

Baltimore, Md.: "The Sun" of the 28th states that although the frost on the morning of the 26th was quite heavy throughout the lower counties of Maryland, no considerable damage seems to have resulted.

Winchester, Frederick Co., Va.: a heavy frost occurred in this vicinity during the night of the 25–26th, injuring all kinds of vegetation.

Abingdon, Washington Co., Va.: about one-third of the tobacco crop was injured by the frosts of the 25th and 26th. Reports from Lovingston, Nelson Co., Buchanan and Fincastle, Botetourt Co., state that the frost on the above dates were light and caused but little damage.

Danville, Pittsylvania Co., Va.: a light frost occurred on the morning of the 25th; the tobacco crop in this vicinity suffered no serious injury in consequence, but considerable damage is reported from Henry county and the counties bordering on the mountains.

Martinsville, Henry Co., Va.: the tobacco crop was more or less seriously damaged by frost on the 26th.

Christiansburg, Montgomery Co., Va.: frosts on the mornings of the 25th and 26th caused considerable damage to the outstanding tobacco.

Winston, Forsyth Co., N. C.: it is estimated that about one-third of the tobacco standing in the fields was damaged by the frost which occurred during the night of the 25–26th. About one-half of the entire crop was standing when the frost came.

Wellsborough, Tioga Co., Pa., 30th: frequent frosts occurred during the month, but no material damage was done until the 26th and 27th, on which dates frost damaged buckwheat and late potatoes in this vicinity.

ICE.

Ice formed in the various states and territories during the month, as follows:

Dakota.—Fort Totten, 16th; Highmore, 23d.

Illinois.—Champaign and Charleston, 24th.

Indiana.—Vevay, 13th, 19th, and 20th.

Iowa.—Albia, ice formed ten miles south of this place on the 16th.

Michigan.—Hudson and Lansing, 23d.

Minnesota.—Moorhead, 15th.

New Hampshire.—Mount Washington, frost work and ice formed on the anemometer cups on the 8th and 25th; and ice formed on water on the 17th; Berlin Mills, 17th.

New Jersey.—Moorestown, 25th and 26th.

New York.—Starkey, ice formed a few miles south of this place on the 17th; Humphrey, 17th and 25th; Factoryville, 26th; Montgomery, ice formed in the lowlands in this vicinity during the night of the 16–17th.

Ohio.—Napoleon and Wauseon, 24th.

Pennsylvania.—Grampian Hills, 26th.

Virginia.—Dale Enterprise, 26th.

Texas.—Thomas C. Osborn, M. D., voluntary observer at Cleburne, reports: "Ice on well rope at 6 a. m. the 29th."

Wisconsin.—Embarras, 16th, 23d, and 24th. Milwaukee, 24th.

Wyoming.—Cheyenne, 27th and 28th.

TEMPERATURE OF WATER.

The following table shows the maximum, minimum, and mean water temperature, as observed at the harbors of the several stations; the monthly range of water temperature; the average depth at which the observations were made, and the mean temperature of the air:

Temperature of water for September, 1887.

Station	Temperature at bottom.				Mean temperature of the air at station.	Average depth of water, feet and tenths.
	Max.	Min.	Range.	Monthly mean.		
	°	°	°	°	°	
Canby, Fort, Wash	60.8	55.0	5.8	58.0	55.4	14.2
Cedar Keys, Fla	87.1	77.1	10.0	81.4	77.6	8.1
Charleston, S. C	82.3	71.6	10.7	76.9	74.0	37.0
Eastport, Me	53.7	51.3	2.4	52.1	54.6	17.6
Galveston, Tex	85.9	71.7	14.2	81.2	79.7	15.5
Key West, Fla	87.0	79.8	7.2	84.8	81.4	21.9
New London, Conn	68.3	62.6	5.7	65.4	61.2	12.1
New York City	71.4	62.5	8.9	67.5	63.1	15.4
Pensacola, Fla	85.4	75.2	10.2	80.5	77.6	18.4
Portland, Me	59.1	53.4	5.7	56.2	57.8	17.8
Portland, Oregon	64.0	59.5	4.2	61.8	59.6	55.6

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for September, 1887, as determined from the reports of about eight hundred stations, is exhibited on chart iv. In the table of miscellaneous meteorological data are given, for each Signal Service station, the total precipitation, with the departures from the normal. The figures opposite the names of the geographical districts in columns for mean temperature, precipitation, and departures from the normal, show respectively the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal, and subtracting when above.

In portions of the Rio Grande, Missouri, and upper Mississippi valleys, in the northern and middle slopes, southern Rocky Mountain districts, and over portions of the northern plateau and north Pacific coast region, the precipitation for September, 1887, is in excess of the average; it is also excessive in southern and eastern Florida, and in the southern portions of Alabama, Mississippi, and Louisiana. The most marked excess (more than four inches) is that for the Rio Grande Valley,